Transmittal # W202783

Description of Siemens Lowell Wastewater Operation:

The neutralization system has been engineered to ensure compliance with the City of Lowell discharge specifications per permit #058. The feed water from our manufacturing process must be neutralized prior to discharge.

The Neutralization system collects the wastewater and passes it through a series of tanks where the pH is measured and either caustic or sulfuric acid is added to neutralize it. After this, it is discharged to the sewer system.

Much of the system is automated in that the computerized control panel continuously monitors, measures, and corrects the water's pH balance as it passes from tank to tank.

Occasionally, an interruption occurs in this process. In that case, the control board triggers an alarm that alerts the operator.

The neutralization system consists of the following major equipment:

- 1150 gallon polypropylene collection tank
- 1000 gallon HDPE reaction tank
- 2 chemical pH adjust storage drums, installed over safety containment tanks with chemical feed pumps.
- Control Panel with PLC controller, pH monitors/controllers, switches alarms and lights.
- Flume with a pH probe/meter and an ultrasonic flow sensor, both of which are connected to dual pen chart recorder

An underground 1150 gallon polyethylene adjustment tank in the vicinity of Column C-6 receives discharge from the production assembly/test areas as well as the research laboratories through one of three 4" inlets.

The waste water is pumped from the floor tank to a 1000 gallon reaction tank which is located adjacent to the floor tank.

A probe in the reaction tank senses the pH of the influent and sends a signal to the ph analyzer in the wall mounted control panel.

The pH analyzer is wired to two chemical feed pumps. Either a 25% sodium hydroxide (base) solution or a sulfuric acid solution is added to the tank as required to maintain acceptable discharge pH.

A propeller type mixer in the reaction tank runs continuously and water is monitored by a separate pH probe.

A second probe monitors effluent discharge from the reaction tank. At this point acceptable effluent is sent to the flume for discharge.

The final pH monitor located at the flume is not chemically adjusted and its alarm set points are set for ph of 5.0 and 9.5 per City of Lowell specifications.

The pH signal at the flume is relayed from the analyzer to a 7 day strip chart recorder with pen.

The pH analyzer is also wired to a high and low ph alarm (horn and light) which will sound if the ph in the effluent is above or below preset limits (limits are 5.0 to 9.5).

The control panel is equipped with a push-to-silence button for manual alarm shut-off.

The treated discharge from the flume exits the flume and ties into the buildings sanitary system.

The support and maintenance of this system is done by 2 Siemens licensed wastewater operators. These operators do daily checks and weekly calibration of the ph probing system. The operators submit semi annual reports to the City of Lowell. Wastewater analysis is performed by Alpha Analytical Laboratories.

System Equipment Specifications:

1. Batch Reaction Tank Level Control : Warrick Controls
   - (part #F-blk-20-T / F-red-20-T, 1amp at 240 vac)
2. Collection Tank Transfer pump: Gould pumps #GT 203, serial#H9849124
3. Collection Tank Mixer: Eastern Mixers (cat #vm3546)
4. Chemical Metering Pumps ; EHB &EHC series Electronic metering pump
   - (part # EH-C35-R-1- VC)
5. Reaction tank mixer: Lightnin Vektor Mixers (part# 271636, 6.8 amps .33 hp)
6. SLC 500 I/O Modules: Allen Bradley (cat#1746-47, 7 slot rack)
7. SLC 500 Program Listing: Allen Bradley/Siemens
8. Ph Meters: GLI Ryton encapsulated Model# 6028P0
9. Chart recorder: Foxboro (Model 40 PR-RSE2F, style A)
10. Flume Flowmeter: Enterra Instrumentation Technologies (model#860